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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/454,027	12/03/1999	DEEPEN SINHA	CASE15-41	3278

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EXAMINER

GRAHAM, ANDREW R

ART UNIT

PAPER NUMBER

2697

DATE MAILED: 04/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/454,027

Applicant(s)

SINHA ET AL.

Examiner

Andrew R Graham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-46 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 December 1999 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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DETAILED ACTION

Drawings

1. The drawings are objected to because they fail to meet the requirements of CFR § 1.84. The drawings are in violation of:

§ 1.84 (g) Margins:

Each sheet must include a top margin of at least 2.5 cm. (1 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 1.5 cm. (5/8 inch), and a bottom margin of at least 1.0 cm. (3/8 inch). These margins are not present in Figures 1, 2, or 3.

- § 1.84 (1) Character of lines, numbers, and letters:

Every line, number, and letter must be durable, clean, black (except for color drawings), sufficiently dense and dark, and uniformly thick and well-defined. The weight of all lines and letters must be heavy enough to permit adequate reproduction. Some of the reference characters in the figures that appear to be hand drawn instead of produced electronically, such as 'D1 Formatter' and 'D2 Formatter' of Figure 2 and 'Inner Convolutional' of Figure 3, fail to meet this requirement.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

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Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. **Claims 1-8, 13-21, 25-32, and 37-45** are rejected under 35 U.S.C. 102(e) as being anticipated by Edler et al (USPN 6360200). Hereafter, "Edler et al" will be simply referred to as "Edler".

Edler discloses a process for reducing the redundancy in the encoding and transmission of multichannel signals. Some of the possible areas of application for the scheme are described as being ISDN, Digital Audio Broadcasting, and computer networks (col. 11,

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lines 35-42). Regarding **Claim 1**, this reads on an "Apparatus for communicating a signal over a plurality of communication channels". The overall encoding system is based upon a predictor circuit (43) that outputs N prediction signals that are combined with the N input channel signals, wherein the prediction signals are based upon comparisons between different versions of the overall N input channel signals (col. 3, lines 43-65). One particular embodiment that Edler discloses involves a dual-channel stereo version of his encoding and transmission system (col. 9, lines 19-55 and Figure 4). From Figure 1a, it can be specifically seen that device receives, encodes, and transmits the left and right channels of a stereo signal (col. 3, lines 1-3). The input to this system reads on "the signal including at least a first component and a second component" and the encoded respective outputs read on "at least a first representation and a second representation of the signal". From the more detailed illustration of Figure 5, it can be seen that each of the input signals $(x(n), y(n))$ subtractively receive values based on inter-channel predictions conducted by the prediction circuit (43) involving each of the input channels. Thus, the first, upper output line corresponding to the input $x(n)$ in Figure 5 includes the input $x(n)$ as well as subtracted predictive values based on $x(n)$ and the other input, $y(n)$. This reads on "the first representation containing first information concerning the first component, and second information concerning at least one coefficient for predicting the second coefficient based on the first information". The other input, $y(n)$,

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is connected in a similar manner and its corresponding output reads upon "the second representation containing third information concerning at least the second component, and fourth information concerning at least one coefficient for predicting the first component based on the third information". As can be seen in Figure 1a, the encoded signals are sent through a transmission channel to a decoder and this process inherently requires circuitry that reads on "an output device for transmitting the first representation and the second representation through the communication channels".

Regarding **Claim 2**, the two-channel embodiment shown in Figure 1a specifically involves the left and right channels of a stereo audio signal, which reads on "the signal includes a stereo audio signal" (col. 3, lines 1-3).

Regarding **Claim 3**, the two-channel embodiment shown in Figure 1a specifically illustrates the left and right channels of a stereo audio signal being connected as the two input signals to which the prediction signals are added, which reads on "the first component includes a left channel signal of the stereo audio signal, and the second component includes a right channel signal thereof" (col. 3, lines 1-3).

Regarding **Claim 4**, it can be seen in Figure 5 that adders (51,54) combine signals from the two input signals, and another set of adders (49) combine these merged signals back with the original input signals and into the overall encoded outputs (col. 5, lines 26-46). This process performed on the first input signal, $x(n)$ reads on "the first

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information concerns a combination of the first component and the second component".

Regarding **Claim 5**, the predictor circuitry (43), which combines the various stages of the two channel input signal embodiment, uses coefficients which are adaptively changed altered in regards to the instantaneous signal characteristics (col. 8, lines 23-67 and col. 9, lines 1-18). This reads on "the combination of the first component and the second component is adaptively determined".

Regarding **Claim 6**, it can be seen in Figure 5 that adders (51,54) combine signals from the two input signals, and another set of adders (49) combine these merged signals back with the original input signals and into the overall encoded outputs (col. 5, lines 26-46). This process performed on the second input signal, $y(n)$ reads on "the third information concerns a combination of the first component and the second component".

Regarding **Claim 7**, please refer to the like teachings of Claim 5.

Regarding **Claim 8**, the decoder (41) receives the signal transmitted by the encoder discussed in regards to Claim 1, which inherently reads on "apparatus for recovering a signal" and "a receiver for receiving at least a first representation and a second representation of a signal". The decoder outputs a reconstructed version of the input signals, which inherently requires that at least one of the received signals be used to construct the input signals. This reads on "a processor for selecting use of at least one of the

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first representation and the second representation to recover the signal".

Regarding **Claim 13**, please refer to the like teachings of Claim 2.

Regarding **Claim 14**, please refer to the like teachings of Claim 3.

Regarding **Claim 15**, please refer to the like teachings of Claim 4.

Regarding **Claim 16**, please refer to the like teachings of Claim 5.

Regarding **Claim 17**, please refer to the like teachings of Claim 6.

Regarding **Claim 18**, please refer to the like teachings of Claim 5.

Regarding **Claim 19**, please refer to the like teachings of Claims 1 and 8.

Regarding **Claim 20**, please refer to the like teachings of Claim 2.

Regarding **Claim 21**, please refer to the like teachings of Claim 3.

Regarding **Claim 25**, please refer to the like teachings of Claim 1.

Regarding **Claim 26**, please refer to the like teachings of Claim 2.

Regarding **Claim 27**, please refer to the like teachings of Claim 3.

Regarding **Claim 28**, please refer to the like teachings of Claim 4.

Regarding **Claim 29**, please refer to the like teachings of Claim 5.

Regarding **Claim 30**, please refer to the like teachings of Claim 6.

Regarding **Claim 31**, please refer to the like teachings of Claim 5.

Regarding **Claim 32**, please refer to the like teachings of Claim 8.

Regarding **Claim 37**, please refer to the like teachings of Claim 2.

Regarding **Claim 38**, please refer to the like teachings of Claim 3.

Regarding **Claim 39**, please refer to the like teachings of Claim 4.

Regarding **Claim 40**, please refer to the like teachings of Claim 5.

Regarding **Claim 41**, please refer to the like teachings of Claim 6.

Regarding **Claim 42**, please refer to the like teachings of Claim 5.

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Regarding **Claim 43**, please refer to the like teachings of Claims 1 and

8. Regarding **Claim 44**, please refer to the like teachings of Claim 2.

Regarding **Claim 45**, please refer to the like teachings of Claim 3.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 9-12 and 33-36** are rejected under 35 U.S.C. 103(a) as being obvious over Edler as applied above, and further in view of Mansour et al (USPN 6353637). Hereafter, "Mansour et al" will be simply referred to as "Mansour".

The applied reference has two common inventors with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference

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under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(1)(1) and § 706.02(1)(2).

As detailed above, Edler discloses a process for reducing the redundancy in the encoding and transmission of multichannel signals.

The system of Edler includes an encoder (40) and a decoder (41), but specific details concerning the decoder are not discussed, including:

- that the selection of the first and second representations of the original signal is based upon the amount of corruption detected in the signals

Mansour discloses a multistream transmission apparatus for processing information that also includes an encoder/transmitter component (201) and a receiver/decoder component (301). The system of Mansour also includes the reconstruction of an original input signal based on the recombination of signals (C, E₁, E₂) received by the receiver (301) (col. 7, lines 66-67 and col. 8, lines 1-2). A

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blending processor (327) is used to determine the viability of these signals based on their data integrities, and control signals are provided to the decoder (330) to coordinate which of the signals (C, E_1, E_2) is used in the reconstructions process (col. 8, lines 3-21). This process reads on "selected based on a measure of corruption of the selected representation".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to add a blending processor as taught by Mansour to the decoder component of the overall system of Edler. Such a modification would have been desirable because it would have provided an intelligent reconstruction scheme for the decoder component of Edler, which would have deterred the output of unacceptably distorted representation of the original input data. Such a modification would have also been desirable because it would have provided the overall decoder/reception system with reference values upon which other adjustments to the receiver would have potentially been made.

Regarding **Claim 10**, the data streams of Mansour are encoded according to well known forward error correction techniques, which reads on "the first representation and the second representation are encoded in accordance with a forward error correction coding technique" (col. 5, lines 28-45).

Regarding **Claim 11**, each of the data streams in the system of Mansour are kept track of in regards to the number of errors detected in a block (col. 7, lines 1-60). A control signal regarding the

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comparison of this number and a threshold value is connected between the decoders (319a-319c) and the blending circuit (327), which again, decides the signals used in reconstructing the input signals (col. 7, lines 1-60). This reads on "the measure is a function of a count of detections of errors in the selected representation, in accordance with the forward error correction technique".

Regarding **Claim 12**, the signal-to-interference ratio obtained from the incoming modems (309a-309c) and their respective subbands is also used in checking the integrity of the incoming data, and when the estimate drops below an acceptable threshold, a corresponding signal is sent to the blending processor (327). This reads on "the measure being a function of a signal-to-interference ratio afforded by the communication channel from which the selected signal is received".

Regarding **Claim 33**, please refer to the like teachings of Claim 9. Regarding **Claim 34**, please refer to the like teachings of Claim 10. Regarding **Claim 35**, please refer to the like teachings of Claim 11. Regarding **Claim 36**, please refer to the like teachings of Claim 12.

4. **Claims 9-12 and 33-36** are rejected under 35 U.S.C. 103(a) as being unpatentable over Edler as applied above, and further in view of Mallinckrodt (USPN 5832379).

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As detailed above, Edler discloses a process for reducing the redundancy in the encoding and transmission of multichannel signals.

The system of Edler includes an encoder (40) and a decoder (41), but specific details concerning the decoder are not discussed, including:

- that the selection of the first and second representations of the original signal is based upon the amount of corruption detected in the signals

Mallinckrodt discloses a system for determining and designating preferred communication connections between a receiver and a plurality of input signal nodes. One of the specific features of the system of Mallinckrodt is the monitoring and compensation for the communication signal based on the bit error rate of the received data (col. 14, lines 28-40). According to Mallinckrodt, static bit error rates can directly be determined unacceptable and variable bit error rates can be compared against an acceptable threshold value (col. 14, lines 35-38). As the signals with the highest signal qualities are inherently the ones preferred, this reads on "at least one of the first representation and second representation is selected based in a measure of corruption of the selected representation".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to include a signal quality monitoring and compensation system as taught by Mallinckrodt in the decoder component of the system of Edler. The motivation behind such

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a modification would have been that such a selection scheme would have provided an intelligent, structured approach to constructing the best possible representation of an original input audio system.

Regarding **Claim 10**, Figure 7 of Mallinckrodt shows an embodiment of the transceiver of the system that includes forward error encoders (114,156) for each of the two shown sources of audio input (col. 13, lines 1-28). This reads on "the first representation and the second representation are encoded in accordance with a forward error coding technique".

Regarding **Claim 11**, the system of Mallinckrodt uses the bit rate error, as discussed previously in regards to Claim 9, to determine the amount of compensation required for the desired signal quality (col. 14, lines 28-40). This reads on "a count of detection of errors in the selected representation, in accordance with the forward error correction coding technique".

Regarding **Claim 12**, Mallinckrodt also states that the signal quality is based on the noise and interference detected in the signal (col. 14, lines 38-40). The signal quality in regards to interference is compared to a minimal acceptable grade of service (col. 15, lines 62-67 and col. 16, lines 1-2). Mallinckrodt discusses that communication channels that can be used can be integrated satellite and ground nodes (col. 7, lines 3-7). Thus, the signal quality measurement and compensation of Mallinckrodt reads on "the measure being a function of the signal-to-interference ratio afforded by the

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communication channel from which the selected representation is received".

- Regarding **Claim 33**, please refer to the like teachings of Claim 9. Regarding **Claim 34**, please refer to the like teachings of Claim 10. Regarding **Claim 35**, please refer to the like teachings of Claim 11. Regarding **Claim 36**, please refer to the like teachings of Claim 12.

5. **Claims 22-24 and 46** are rejected under 35 U.S.C. 103(a) as being unpatentable over Edler as applied above, and further in view of applicant's admitted prior art.

As detailed above, Edler discloses a process for reducing the redundancy in the encoding and transmission of multichannel signals. One of the areas of application that Edler discloses is "Digital Audio Broadcasting" (col. 11, lines 35-42).

Yet, Edler does not specify:

- that the communication channels are simultaneously available for transmitting the two representations of the original input signal

In the applicant's disclosure, the applicant discloses that in many prior art, Digital Audio Broadcasting (DAB) systems, "it is possible to transmit audio signals over multiple alternative channels, which are simultaneously available for signal transmission" (page 1, lines 30-32 and page 2, line 1). This reads on "the communication

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channels are simultaneously available for transmitting the first representation and the second representation".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to transmit the encoded signals of Edler over simultaneously available transmission channels as described in the admitted prior art. Such a modification would have been desirable because split, simultaneous transmissions would have enabled concurrent and continuous redundancy and signal reconstruction to take place.

Regarding **Claim 23**, the admitted prior art discloses that terrestrial as well as satellite digital audio broadcast systems have already been proposed (page 1, lines 10-12). This reads on "the communication channels include satellite links".

Regarding **Claim 24**, the admitted prior art, again, discloses that terrestrial as well as satellite digital audio broadcast systems have already been proposed, along with the concept of transmitting multiple signals over multiple channels (page 1, lines 10-12 and page 1, lines 30-32 and page 2, line 1). While, based on these two points of admitted prior art, such a combination would have been inherently possible, the motivation behind adding a third representation would have been the improved error correction provided by the increased redundancy. The motivation for establishing this third signal as a terrestrial link would have been that, though having a more limited range, a terrestrial signal would have been less susceptible to

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atmospheric disturbances than signals received from and transmitted to satellites.

Regarding **Claim 46**, please refer to the like teachings of Claim 22.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Minami (USPN 4815132) discloses a stereophonic voice transmission system that combines a channel signal with a coefficient representing the other channel of the audio input and transmits this composite signal to a receiver that decodes it appropriately.

Elder et al (USPN 5511093) discloses a method for reducing the data in a multichannel transmission that also uses an original channel signal and an adjusted signal representative of the other channel of the input signal.

Honda et al (USPN 4538234) discloses a processing system that includes an adaptively predictive encoding to the transmitted audio signal.


H'Mimy et al (USPN 6240275) teaches a communications system that handles input channels based on the detected levels of signal quality and interference.

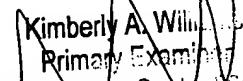
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Graham whose telephone number is (703) 308-6729. The examiner can normally be reached on Monday-Friday (7:30-4:30), excluding alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly Williams, can be reached at (703) 305-4863. The fax number for the organization where this application or proceeding is assigned is 703-872-9314 for regular communications, and 703-872-9315 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.


Andrew Graham
Examiner
A.U. 2697


Kimberly A. Williams
Primary Examiner
Technology Center 2600


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